



LAUREA

SOFTWARE IN TOURISM INDUSTRY

A Study On Emerging New Niches Of Software In Hotel Industry



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2010 Kerava

Laurea University of Applied Sciences
Kerava

A Study on Emerging New Niches of Software in Hotel Industry

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Degree Programme in Tourism
Thesis
September, 2010

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Year	2010	Pages	48
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This study was structured as a part of Bachelor Degree thesis in Tourism Degree Programme in Laurea University of Applied Sciences. The study examines the role of software as a major component of ICTs (Information and Communication Technologies) in hotel industry in Finland. The study was conducted in three major hotel chains in Finland in order to identify the scope and possibility of developing new software module within the periphery of contemporary Property Management Systems (PMS). Market situation of PMSs was assessed through the analysis of the information gathered from three major hotel chains of Finland within Greater Helsinki Area.

The study explored the importance of technology and its use for business operation in one of the branches of hospitality industry i.e. accommodation services. Accommodation service sector is in the stage of evolution with the use of ICTs. Communication technologies have played a vital role in the development, operation, marketing and distribution of accommodation services. The implementation of technology for service management and production has made the industry competitive which has resulted in the growth of new business ideas and implication within the industry.

This thesis deals with the importance of ICTs in travel and tourism industry and provides a glance on the role of software as a crucial component of ICTs operating in entire service function of the industry. Further, it concentrates on finding emerging new niches of software by assessing the level of satisfaction of employees using PMS, problems occurred during system handling, new ideas and needs felt. The use of a mixed method was made during data collection of the research in order to get factual data. The correlation between different prospective of data was established and analysed to identify emerging niches of software in the industry.

Key words:

Software, Hotel Industry, Property Management System (PMS)

Contents

1	Introduction.....	6
1.1	Aim	6
1.2	Purpose of Thesis	6
1.3	Research Time Frame	7
2	Research Background	8
2.1	Research Problem	8
2.2	Research Outline.....	8
2.3	Delimitation of Research	9
2.4	Structure of Thesis	9
3	Role of ICT in Tourism	10
3.1	Tourism-The industry of Information	11
3.2	Characteristics of Tourism Services	13
3.3	eTourism	15
4	Property Management System (PMS) in Hotels	17
4.1	PMS and Its Function	18
4.1.1	Reservation	18
4.1.2	Check-in and Check-out	19
4.1.3	Guest History	19
4.1.4	Room Management	19
4.1.5	Management application of PMS	20
4.1.6	Back office function.....	20
4.1.7	Guest room technology	20
4.1.8	PMS in Food service sector.....	20
4.1.9	Travel Agent Accounting	21
4.1.10	Function Room Scheduling.....	21
4.1.11	Golf Tennis and other Amenity Management	21
4.1.12	Condominium and Time Share management.....	21
5	Development of Research	22
5.1	Participants.....	22
5.2	Research Methodology	23
5.3	Data Collection.....	24
5.4	Data Analysis	25
6	Empirical Findings	27
6.1	Current software market situation of PMS	27
6.2	Customer satisfaction from PMS	30
6.3	Problems in Using PMS	32

6.4	Improvements required.....	34
6.5	Future needs and demands	36
6.6	Summary on Empirical Findings	38
7	Validity and Reliability	40
8	Discussion	41
9	References:	42
10	Appendices 1-4	44

1 Introduction

Tourism industry is information intensive because of the nature of its services and products (Buhalis, 2003). Rapid development of communication technologies has contributed a lot to the development of the industry. Tourists are able to make personal decisions regarding travel subsidiaries, accommodation, food and activities provided at destination just sitting at home with the use of ICT. Different web based (web 2.0) information facilitators such as booking engines, travel blog; wikis, micro blogs (social media), service provider's web sites, user ratings and comments regarding the products and services are the tools for travel decision apart from personal feedback. Web 2.0 has made the world smaller virtually. One can connect friends through social media and inquire for the reliability of the services provided at destination up to some extents. Everyday new research and innovations are being made to provide unique experience to travellers by the service providers in the industry. As a result, the use of ICT has made travel and tourism business easier, cost effective, productive; profitable and customer service centric. This thesis is a tiny effort in the field of travel and tourism industry which focuses on the importance and implementation of ICTs for the competitive and strategic development of services.

1.1 Aim

The aim of this thesis is to research the use of software in Tourism industry as a part of ICT within the hotel industry in Finland. The thesis concentrates on the need of ICT, current software market situation, user satisfaction, problems, improvements, new needs and demands of software. Thesis uses mixed data collection methods (quantitative, qualitative and document analysis) to draw a picture of user satisfaction and future trends for software through questionnaires, interviews and literature analysis. The survey and interview are conducted within three major chains of the hotels (Restel Group, Sokos and Scandic) in Finland.

1.2 Purpose of Thesis

This thesis is a research of software in tourism industry mainly focusing accommodation services in Finland. The idea of the thesis was generated during my (Krishna Kumar Regmi) internship in Vetokonsultit Oy, Kerava. Vetokonsultit Oy is an IT company working in the field of ERP development specifically and generally in other software development area. I did a project named 'Tourism' in the company as a major target of my internship. During the project I realised the need of research in tourism industry since I found the possibility for new niches of software to be grown in travel and tourism industry in Finland. I looked for other similar thesis works through internet, Google, universities thesis works and theseus.fi (Electronic Library of the Universities of Applied Sciences). Unfortunately, I was not able to find any research made for the development of software in travel and tourism industry in Finland. This gap was another factor to inspire me towards the thesis topic. After listening the idea of

this thesis Bikesh Thapa (second author) agreed to join me and work together for this research since he has long experience working with hospitality industry. We were interested in the topic of software and ICT in tourism industry. Since the industry is information intensive due to certain characteristics of its services and products such as heterogeneity, perishability and intangibility. ICT is the major part of service operation in tourism industry. The rapidly changing trends in consumer behaviour and technology have opened new market and opportunity for new software to be developed. It was effective to develop a research on this topic since Vetokonsultit Oy was interested to support for further research in terms of guidance and technical aspects related to software if needed. Additionally we utilized the contacts of Bikesh in hospitality industry in Helsinki metropolitan area in order to complete research questionnaires. Apart from this we were able to create contacts with the help of Laurea University of Applied Sciences. I had contacted some hotels in Helsinki personally and the research was conducted in a wider range.

We came across with some excellent studies made internationally on 'Information Technology in Tourism'. The latest collection of research was published in 2010 with the title 'Information and Communication Technology in Tourism 2010'. It was inspiring to read this research and it provided us guidance during our thesis process. Apart from this great piece of academic writing we went through a variety of books related to our research theme.

While studying in Laurea, we (students) have been focused on operational studies of tourism industry. We rarely came across with the terms used in Information communication technology for different services and service providers related to travel and tourism industry such as CRS, GDS, DMS, POS, PMS etc. For this reason, we decided to make a small effort through this research in order to open a new field for research in Tourism studies in Laurea so as to provide an insight for the need of tourism related ICT studies in Laurea's Tourism Degree Program.

1.3 Research Time Frame

The thesis process was divided in to three vital stages namely literature study, empirical research and analysis. In September 2010, we went through literature studies and collected major piece of literature to develop research topic from available resources such as library and internet. October was dedicated for empirical research; we collected data through questionnaire and interviews; prepared them for processing using SPSS program. The result of research were analysed in November and we made final presentation of our research in December 2010.

2 Research Background

Hospitality sector is one of the major components of tourism industry. Every overnight stay during any trip or visit needs services from hospitality industry. This sector of tourism industry falls under second major touch point for customers after travel sector in tourism. The first use of IT in hospitality industry was made in Hilton, New York in 1963, an IBM minicomputer which was used to manage guest room (Sayles, 1963; Alvarez et al., 1983). The history began with IBM minicomputer has reached at the micro size in the form of smart phones which is made possible with the aid of information technology. Industry is trying to manipulate smart phones for future communication purpose at some extents. The services are changing into commodities therefore; every service provider is in quest of new values that can be added to the services being provided. In order to develop an outstanding service the providers are using augmented products and services. Most of the augmented services are derived some way through the use of technology.

It is quite challenging to begin research on this topic in Finland since no such research work on a particular subject was made earlier. This thesis is an attempt to begin research on the topic of software and tourism. The effort being made is from a scratch and basically based on other international research papers, articles and books along with a survey conducted among three major hotel chains in Finland. Focusing the facts and use of information communication technology, this thesis explores the need of augmentation in Property Management Software in order to create outstanding services for the customers in hotel service sector.

2.1 Research Problem

Research of thesis is based on software and its use in hotels in Finland. Focus of research is to explore Property Management Software used in major hotels in Finland. The study is conducted to explore the opportunities for new software niches within the periphery of Property Management Software. The research problem for the thesis can be stated in one sentence as follows:

Which are the new emerging niches in hotel industry to develop new software?

2.2 Research Outline

The outline of the research is concentrated on two major sources i.e. literature and mixed data collection methods (Survey, Interview, Document Analysis). Thorough discussion and literature review is the result of explorative research of theories and articles developed in Tourism and ICT. Apart from this the thesis provides quantitative explanation of the research outcomes. The outline of thesis is stated in Figure below:

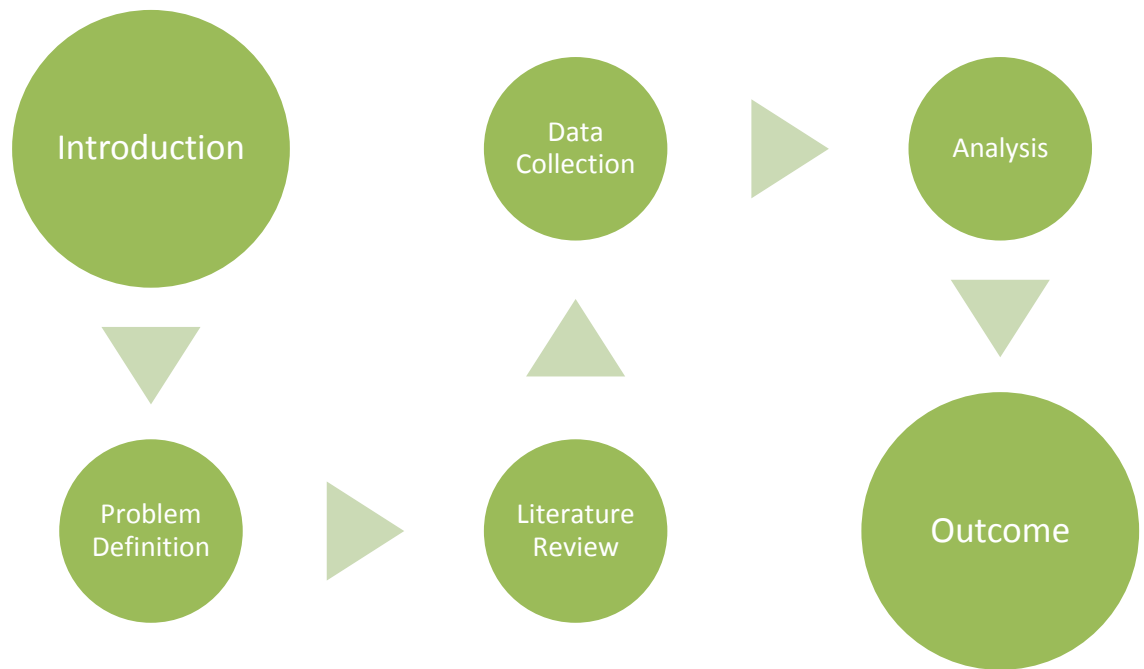


Figure 1: Outline of the thesis

2.3 Delimitation of Research

This thesis covers a wider area since it is speaking about ICTs in tourism generally and software in tourism specifically. The research provides overall illustration stating that how tourism industry is influenced by ICT. Further, it discusses about the specific software used in hotels i.e. PMS. The experience of employees in context of software's usability, effectiveness, suitability and innovativeness was collected from major hotel chains of Finland within Helsinki metropolitan area. The collected data is examined in order to describe the hotel software market situation of Finland and possible new emerging niches to develop augmented features for the software.

2.4 Structure of Thesis

The structure of thesis consists of 8 sections. First section of thesis deals with introduction, aim, purpose of thesis and research time frame. The second section is the collection with research problem, research outline, and delimitation of research and structure of thesis. The third section comprises of theoretical analysis which explains Role of ICT in tourism, tourism the industry of information, characteristics of tourism services and etourism. The fourth section gives light on property management systems in hotels and PMS and its function. The fifth section concentrates on development of research, participants, research methodology, data collection and data analysis. Empirical findings, customer satisfaction from PMS, problems in using PMS, improvements required, future needs and demands, summary on empirical findings are the topics of discussion based on research in the sixth section of the thesis. The seventh section of thesis deals with validity and reliability. The last section focuses on discussion.

3 Role of ICT in Tourism

New business opportunities are growing and expanding with the diffusion of ICT and tourism (Buhalis, 2003). Information technology is a tool for tourism to develop the environment for communication and information exchange among stakeholders and consumers. Global expansion of tourism is made possible due to rapidly growing technology since information exchange tools are embedded to the service providing facilities. Information technology is seen as a major technique to be implemented in order to circulate the information exchange among service providers, producers and customers. According to Poon, "Tourism is a very information extensive activity. In few other areas of activity are the generation, gathering, processing, application and communication of information as important for day to day operations as they are for travel and tourism industry" (Buhalis, 2003, 76).

Intangible tourism services and products need a show case of technology which can make them visualise to the customer either in the form of printed materials or audio and visual format (Sheldon, 1997). Tourism customer has a bigger disadvantage since the customer buys tourism services on the basis of description given during sales procedure and experience of the promising product and services are felt after using them (Sheldon, 1997). Tours and visits are often expensive recreational activities. The involvement of family, friends and relatives is expected highly for full enjoyment of the vacation during a trip or visit by the customer. Therefore, providing a clear picture of tourism service to the customer is very essential and information communication technology is only the way that can provide a visualisation of the services and products being bought by the customers (Sheldon, 1997) in different forms ranging from hard copy to digital soft copies in a variety of structures. Hence, the intangible services brought into tangible form communicate with the customer in order to provide a clear image of them before purchase. This transformation helps customers in understanding the service, its value, quality and reliability.

Making ICTs an important part of tourism industry is a new area for research (Buhalis, 2003). The use of ICT in developing effective business environment is a hot issue nowadays, a number of scholars have spoken and written about the importance of ICTs as a tool for overall development of business environment with increased customer satisfaction (O'Connor, 1999; Inkpen, 1998; Marcussen, 1999a) and lower operation costs. The result of the research conducted among the managers of 3600 Austrian hotels says that impact of ICTs on gaining productivity in hotels is positive and significant (C. Scholochow, M. Fuchs, W. Höpken, ICT In Tourism, 2010). The use of ICT is imperative for the development of services and service providing landscape in hotel industry. Software is one of the major components of information and communication technology (Buhalis, 2003) which plays crucial role in dissemination of hotel service concept and ICTs. The notion of software for information exchange, gathering, processing and publishing in tourism industry is derived from some particular attributes that

tourism possesses. The following headings are briefly discussing the concept of information and its manoeuvring in tourism.

3.1 Tourism-The industry of Information

Tourism industry is directly or indirectly associated to all the major economic development point of a nation such as business, politics, education, health, science, events, culture etc. This connection makes tourism an outstanding industry which needs to process and communicate an outsized volume of information (Sheldon, 1997) for its functionality from consumer to service provider, developer, distributor, intermediary, advertiser etc. and vice-versa. Delivery of information and its exchange along with processing occurs at different echelon, with different intensity among the stakeholders, sectors and agents of tourism industry.

The major flow of information exists among three major agents of tourism viz. suppliers, travel intermediaries and travellers (Sheldon, 1997). The following diagram shows the flow of information in tourism industry.

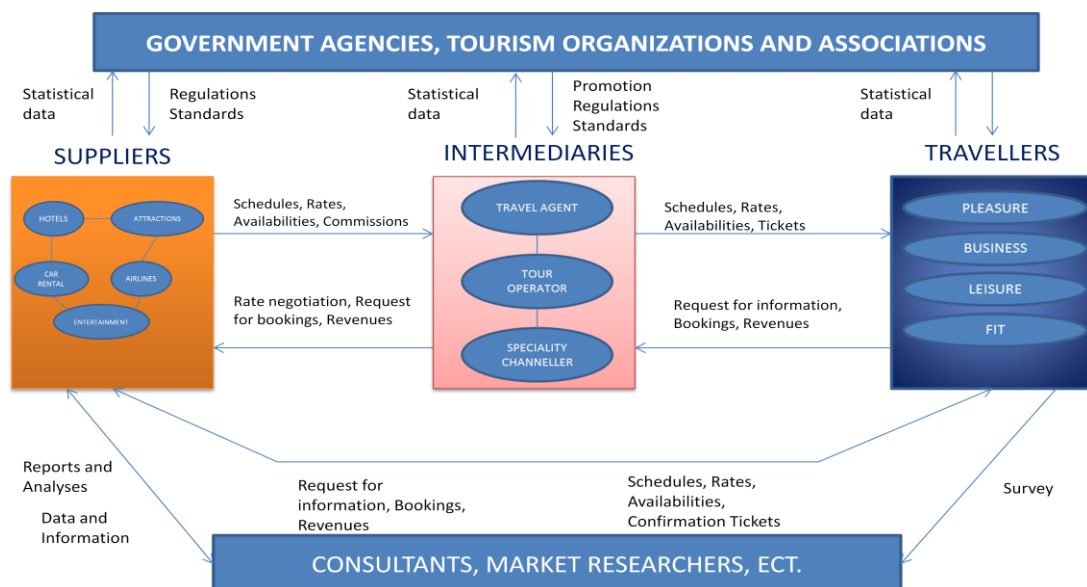


Figure 2: Flow of information in tourism industry (Sheldon, 1997)

As shown in Figure 2, suppliers provide information to intermediaries regarding rates, schedules, availability, special offers, commissions and promotion of services and products to be provided to the end customers. Intermediaries provide information regarding the purchase of services such as booking request, rate negotiation, customer information and revenue. Travellers receive information about tourism services and products both directly from suppliers or intermediaries and vice versa. Information communication goes among suppliers regarding different business activities and collaboration with the industry. The intermediaries also

share information regarding product purchase and sales if the transaction of services is made among them. The two other major interest groups government agencies, tourism organisations, associations deliver and receive information regarding regulation related to services, business establishment, trainings, seminars and other necessary activities that are conducted during business process. Tourism consultants, market researcher and other external adviser maintain the database of business for the suppliers, conduct research among suppliers, traveller and intermediaries in order to make functionality of service operation innovative, enjoyable and easy to use.

The whole information circulation, manipulation, gathering, and managing within the industry is not possible just through manual efforts. The industry needs to manage the information timely, accurately and update them as per the requirement in a great volume from travel to hospitality sectors. Thus the implementation of ICT becomes of a major importance and the use of software to maintain information as per the requirement occurs. Every entity of tourism industry uses different types of software developed to satisfy the need of information processing for their business purpose. Tour operators, travel agencies, transportation suppliers, accommodation providers, restaurants, recreational activities centres etc have different products and services along with mode of supply hence they need specific software to maintain data with their organisation and to develop collaboration with other stakeholders. World Wide Web and Internet are the platform which facilitates the connection among all the agencies, stakeholders and customers in order to share information and conduct distance business term as e-Business. The business electronically done in tourism industry is known as e-Tourism (Buhalis, 2003). The concept of software and its connectivity is shown in Figure 3.

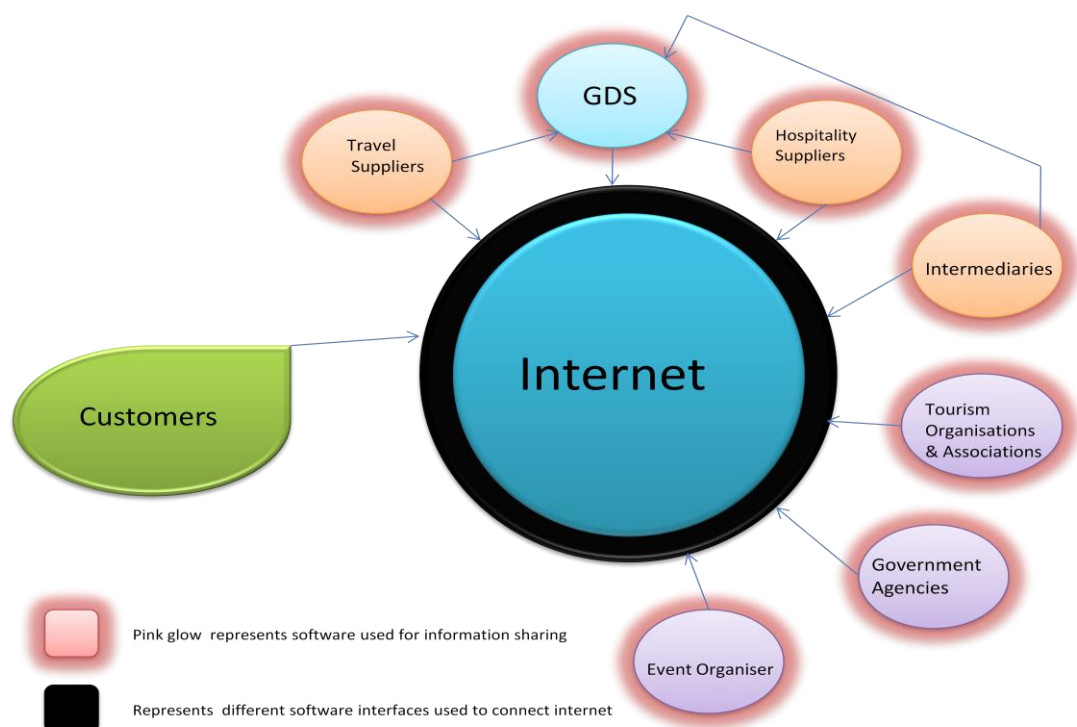


Figure 3: Information sharing using software

Software are used for two major purposes viz. front office and back office in the organisations. Pink glow in the Figure 3 represents front office and back office software used by the stakeholders of tourism industry (Buhalis, 2003). Front office and back office software can be either different module of a software or different software based on nature of function and policy of development of software house. Front office software facilitate operations of suppliers for customers such as check in, check out, request, ordering, point of sales, air ticketing, tour booking and scheduling etc whereas back office software supports organisational needs and managerial tasks such as planning, implementation, monitoring, financial transaction management and accounting, payroll, supplies, inventory control, security, food and energy monitoring and managing etc. Combination of such software provides cost effective data processing accurately and timely in a large volume (Buhalis, 2003).

The information required fetching to the customers and other stakeholders are sent then to the internet with the help of software and websites. The black colour in Figure 3 represents operating system software with internet browser which is required to connect in house software with internet. Windows, LINUX, Apple/Mac and UNIX are the operating system software commonly used today. Customers use personal computers and smart phones to connect to internet and browse information regarding travel and holiday package in order to book a holiday or travel with suppliers or intermediaries. Apart from back office and front office software industry uses vast variety of multimedia software in order to present time based data such as video, voice and animation, space based data i.e. graphics, text and images on the web of the service provider. Thus application software is the major tool for information generation, processing and delivery in tourism industry.

3.2 Characteristics of Tourism Services

Certain characteristics of tourism services make them information intensive. Since tourism services are heterogeneous, intangible, perishable and international. It is very important that the information regarding the services can be delivered timely and accurately to concerned society and end customers. Figure 4 shows characteristics of tourism services which makes



Figure 4: Characteristics of Tourism Services (Concept from Philip Kotler, et.al., 2003, Sheldon, 1997)

them information intensive.

Tourism services are perishable since they cannot be stored for future use (Philip Kotler, John Bowen, James Makens, 2003, Sheldon 1997). If a room of a hotel is not sold for one night the revenue related to this unsold room cannot be gained for the night again. Therefore, delivering timely and accurate information about the services is very essential in tourism industry. Sudden change in demand and accidental hazards are to be reported in time to the concerned stakeholders and customers in order to prevent any uncomfortable circumstances. Tourism services are sold in a chain, in other word a travel ticket is sold by travel agencies, tour operator, air ticket terminal and online ticket sellers. The information of sold seats, vacant seats, flight time, change in flight schedule, food and beverage requirement, stop over, length of journey, carriage limit etc are to be delivered to all the booking partners and customers timely in order to sell a comfortable journey to the customers with a certain profitability for the organization. Using ICTs the industry is able to provide all the updates regarding events and programs to the customers and partners beforehand. In the other hand the customer are able to provide feedback of the services and products of the company through software in web. ICTs have made a two way communication possible with the aid of multimedia in the web and offline. Behind all the services, software is a major component to process and deliver information to the related sectors.

The services in tourism are intangible and experienced after purchase. Furthermore, they have lack of tangibility even after experience (Philip Kotler, John Bowen, James Makens, 2003). It is crucial to provide a clear illustration of services to be sold to the customer in order to make purchase decision easier and simpler. Suppliers of the services and intermediaries use different types of software to illustrate the services to the mass of customers such as printed flyers, brochures, electronic brochures, web description (text), 3D image, picture, videos, sound etc. Hence the importance of software cannot be neglected in tourism industry.

Products in tourism and the entire industry consist of a number of fragmented services. The fragments are produced by different producers and supplied by a number of suppliers to compose a single service (Sheldon, 1997). A traveller is served by at least 35 industrial components as identified by US Standard Industrial Classification System (Gee et al., 1994). Hence the collaboration among these industrial components becomes a vital issue before launching a product or service to the customers. For example, a trip purchase by customer includes air service, hotel service, city tour, etc from different firms and agencies (service providers). Engagement of various fragments of services and industry sectors makes the tourism services heterogeneous. A complex and international service is more heterogeneous since it consists of international components along with large volume of information (Sheldon, 1997). Communication among these service providers is a must for making the service a combined package in order to sell the services together for customers. Hence information technology provides

channels and links between customers and different industry sectors to make the planning and experience of the customer's trip flawless (Sheldon, 1997).

3.3 eTourism

The prediction of Travel Industry Association of America says that travel and tourism products will be one of the most transacted products in online market place (TIA, 1997). Growing number of online users sophisticated and knowledgeable users demand technology and its implementation for timely and accurate transaction through ecommerce and mcommerce (mobile commerce) (Dempsey 2000). Most of the tourism services and products are purchased online today. During our data collection process the manager of one of the hotel in Helsinki invoked with the information that 'We get all the bookings of room online and front desk is just a facilitator for providing other services and information for customer. Customers get discounted price while booking online and it may be easy for them look for information and other detail of the services through web therefore, online booking is grown in recent years.' Customers are attracted to the incentives provided by the suppliers on electronic purchase (Jones, 1999).



Figure 5: Illustration of Online Software used for eTourism

Lack of availability of products in local market, greater selection of goods and services, better price, friends' recommendations are other estimated reasons for growing online purchase nowadays (Jones, 1999). In order to manage proper online marketplace the industry and its stakeholders need to identify the new emerging segments of customers and enhance the market environment to attract them for have a competitive advantage of the flow. Opportu-

nities such as selection of goods and services, flexible price, easiness, better customer service are major requirement of the customer which has become easily accessible due to ecommerce in which knowledge about product; price and its reliability can be easily provided. According to Starkov and Price, (2008 [Oct 10, 2010]) more than 45% of all the hotel bookings will be done online by the end of 2010. "According to a 2008 survey, 83 percent of Finnish adult and 62 percent of adult in the European Union have used internet during the last three months, In Finland, 70 percent of the internet user had browsed travel and tourism information, and 33 percent of the user had conducted online shopping. 60 percent of the value of ecommerce in Finland comes from travel and tourism industry. (Statistics Finland [August 2, 2009])" (Pesonen and Palo-oja, 2010, 51-52). The results of statistics prove the growing need and popularity of online purchase in Finland. It is obvious that there is no better option for travel and tourism industry to grow internationally except the use of eTourism. Development of eTourism is based on information and communication technology thus ICTs play vital role in expanding tourism globally and use of software in ICTs is a must.

4 Property Management System (PMS) in Hotels

Hotels introduced systems to manage their inventory and hotel chains introduced group wide systems in the early 1970s (Buhalis, 2003). The systems were focused on in house management and operated to manage day to day customer service function along with electronic distribution channels such as CRS and GDS (Buhalis, 2003). The systems were named Property Management Systems and dedicated to overall operations of a hotel from reservation to payroll management. The concept of PMS was to utilize the flow of database with inventory in order to achieve the above mentioned functions (O'Connor, 1995). PMS has a number of interfaces. The interfaces are illustrated in Figure 6.



Figure 6: Property Management System Interfaces (Concept from Sheldon, 1997)

PMS is the central computer system which handles the core functions of the properties and its information processing in hospitality industry (Sheldon, 1997) such as hotels, motels, guest house, campsite, condominium and so forth. The functioning of PMS includes reservation, front-back office operation, and managerial functions, remaining a central hub for all the other systems used in hotels for other service purposes (Sheldon, 1997). Common objectives to use PMSs were 'improving capacity management along with operation efficiency, facilitating central room inventory control, providing last room availability information, offering yield management capability, providing better database access for management proposes, supporting extensive marketing, sales and operational reports, providing travel agency tracking and commission payment, tracking frequent flyers and repeat hotel guests, direct marketing and personalized service for repeat hotel guests (Buhalis, 2003), establishing customer relationship management, and reducing operational costs with the aid of technology.

4.1 PMS and Its Function

The functionality of PMS is classified into basic and specialised. The major functions of PMS are discussed in this section which includes reservation module, check-in, check-out, guest accounting, guest history, rooms management and so forth. Figure 7 is an illustration of PMS's functionality at Sheraton Hotel.

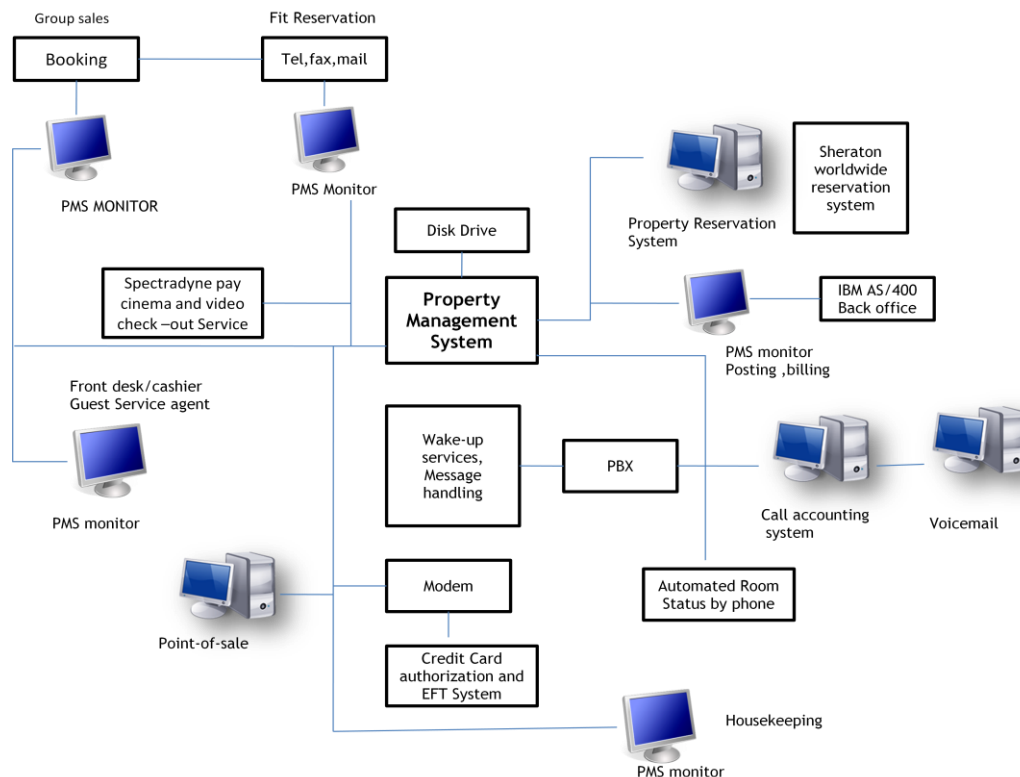


Figure 7: PMS Interfaces at Sheraton Hotel (Sheldon, 1997)

4.1.1 Reservation

The reservation is handled by the PMS at property level. The reservations are received in the form of email, phone calls, faxes, letters, from hotel's website, bookings from GDS. All the reservation received is the subject to be entered into the PMS.

If the hotel is a part of a hotel chain or other CRS the reservation are directly entered into the interfaced PMS from the CRS via internet.

The reservation module of a PMS keeps the record of the guest's preferences such as room type, special request, dates of stay, deposit information, details about their booking agent and generates confirmation notices. Reservation module can facilitate single and group reservation based on request and requirement of the guest (Sheldon, 1997).

4.1.2 Check-in and Check-out

PMS facilitates with C-IC-O. The facility differs on the basis of use of level of technology. The C-I process brings the guest's reservation file into an active in-house file and a guest folio is opened. Check in can be done at the reception by the hotel employee for the guest or self check in machines can be used which can greet guest issue a key, guide the direction of the room. Such machines are either activated by swipe of a credit card or by motion detector. The rapid development in ICT has brought many option in to practice for check in services the self check in devices used today may be a touch screen or key board driven, hand held, remote wireless check in services can be used for remote check in (Sheldon, 1997).

In check in module, once the guest folio is initialised all the charges throughout the stay are posted either manually or electronically in to the folio.

Check out procedure is related to cash payment. Most of the hotels have check out at front desk as check in. But in the hotels automated with self check out machines the guest does not need to visit front desk for check out. Guest can view the total bill and make a payment through the machine and receives a receipt. In many hotels the check out is facilitated through TV. The guest can use remote and check the bill and pay them online. Such TV is often has a printer which can deliver a receipt of the payment (Sheldon, 1997).

4.1.3 Guest History

Guest history is an important part of PMS which can be used as a powerful marketing tool. The PMS facilitate to create such history databases after the guest is checked out. These databases are used for research and marketing purposes (Sheldon, 1997). Guest history helps in understanding the nature and manner of guest in using services of the properties and provides background for improvements. This database also facilitate the future transaction of the guest the address, credit card number and other data entry is not required to be fed again.

4.1.4 Room Management

Room management is another significant feature of PMS. This module of PMS helps in tracking the status of room and provides information for housekeeping department in order to support their work. This module of PMS contains the information regarding room type, its number, and amenities in room, room rates, location, and the status of each room. The status can be vacant, occupied, dirty, clean, inspected and uninspected. The room status gets changed after each C-IC-O. Another important function of this module is to provide all the updates regarding the status of the room in order to increase occupancy rate of the room. The room status is updated periodically by housekeeping staff (Sheldon, 1997).

4.1.5 Management application of PMS

The database of PMS provides management with real-time information in order to understand the operation of the property. It provides online statistics of different operations such as occupancy percentage, average room rate, gross operating profit, room sales and so forth. PMS supports in generating marketing report, arrivals and departure reports, guest behaviour report, feedback report, complaint report, night audit report and so forth (Sheldon, 1997).

It supports Revenue management or yield Management programs by providing all the necessary data in order to provide the decision making of room rates and appropriate time to change them so as to maximize the yield.

4.1.6 Back office function

PMS carries out all the back office functions such as processing of payroll, employee information, accounts payable and receivable, inventory, and purchasing. Providing reports on revenues, sales, customer relations and commissions paid etc.

4.1.7 Guest room technology

The PMS can be featured as required by the properties. New facilities and features can be added in order to provide tech savvy services to the modern guest. The list of such facilities is given below.

- Electronic lock
- Guest information and entertainment services
- Call accounting system
- Internet facilities (Sheldon, 1997)

4.1.8 PMS in Food service sector

The food service sector of a hotel has a Point of sales which is connected to PMS and all the purchases either can be paid at the POS or entered in to the guest's folio for final billing. These terminals can be single or multiple and self ordering where guest can place an order pay bill or place an order and transfer the bill to the folio. (Sheldon, 1997)

Apart from this function PMS also provides facility for restaurant management. Using the restaurant management system, the hotel can manage the purchasing and inventory control of food items, menu and recipe control items on order, details of suppliers, inventory control systems tracks the par level so that ordering can be automated.

4.1.9 Travel Agent Accounting

Keeping the record of commissions of the travel agents through whom the rooms are booked is done by PMS. The commission are tracked at the time of reservation and calculated in individual account of travel agents. The cheque for such commissions is generated automatically by PMS on weekly or monthly basis (Sheldon, 1997).

4.1.10 Function Room Scheduling

The PMS is capable to manage function rooms in hotels. The numerous function rooms can be banquet rooms are used for convention, meeting, seminars and other social event and gathering. PMS manages the upcoming events and stores information regarding setting of the room, decoration, equipment required for event, man power requirement, food and beverage and other requested entities are recorded in PMS in order to manage a successful event hall (Sheldon, 1997).

4.1.11 Golf Tennis and other Amenity Management

Managing the record of the sport entities, renting them, scheduling time for the court booking court for guest and their management are scheduled in the PMS (Sheldon, 1997).

4.1.12 Condominium and Time Share management

It is a different module in PMS which manages accommodation units owned by different parties. This module kept detail information of the owner of the properties, track the payments and provides facilities for overall management of the properties (Sheldon, 1997).

5 Development of Research

With regard to the aim and purpose of this thesis, the major contemplation is concentrated on finding the emerging need for budding new niches of software within the periphery of contemporary Property Management Systems being used in the hotels in Finland. The study is based on perception of employees in hotels who are experienced using computer systems for day to day operation in hotels. Study focuses the type of PMS used in three major chains of hotels in Finland and describes the usability performances of the systems in context of perception gathered along with other related facts. Functionality problems in the systems, suggestions for improving them, embedding new ideas, requests and features to the system are other concerns of the study. Know how of the basis of choosing software for hotels and their impact on chain functionality along with the process of switching from one kind of software to another are the factors for research during the study in order to create a scenario of decision making process within hotel industry.

In regard with the research problem of the thesis the research question is ‘Which are the new emerging niches in hotel industry to develop new software?’ The question is the central part for the development of survey questionnaire so as to access the need and importance of emerging niches around property management software. Research journey is rarely linear. This is why it is important to develop a clear question for direction setting (Zina O’ Lary, 2004). This analytical approach of Zina was used to concentrate on the central idea of the research. The process of development of the questionnaire began from reading to brainstorming and then we discussed the methods to be used for data collection and finally we came up with research questions. Though it was challenging to develop a question structure for the central idea since the idea was straight forward and focal toward exploration of new niches of software in hotel industry, we succeeded in developing an appropriate and directive questionnaire for survey.

5.1 Participants

The study was conducted among the employees of the hotels. An attempt to collect diversified perception from different level of employees was made. As a result, the respondents in our inquiry involved staff representing management and front line employees in the hotels. It was useful to have a variation of positions among employees since we needed to access the perception of employees on different modules of the software used in hotels including front and back offices. There were 23 respondents for the survey questionnaire out of which 2 questionnaires were invalid because of multiple answers ticked in scaling questions.

At the end of the survey we took additional feedback on systems used and had brief discussions on the problems mentioned and suggestion given through questionnaires. The additional feedback sessions were beneficial since they supported the findings to be more concrete and

valid in terms to analysing the data for empirical findings. The discussion during supplementary feedback leads us to new information that was not expected to be encountered during questionnaire designing and testing process (pilot).

5.2 Research Methodology

The subject of the research was a new area for study in the field of travel and tourism industry. There was no such research found previously discussing and exploring the use of PMS in hotels in Finland. It was challenging to explore the suitable methodology in order to reach the goal of research along with extreme analysis. Therefore, the study used three different methods of data collection as show in the Figure 8 so as to achieve the aim and purpose of the research. The combination of different data collection methods is termed as mixed method which triangulates the information from different data sources (Campbell & Fiske, 1959). Figure 8 further explains methodological design of this research.

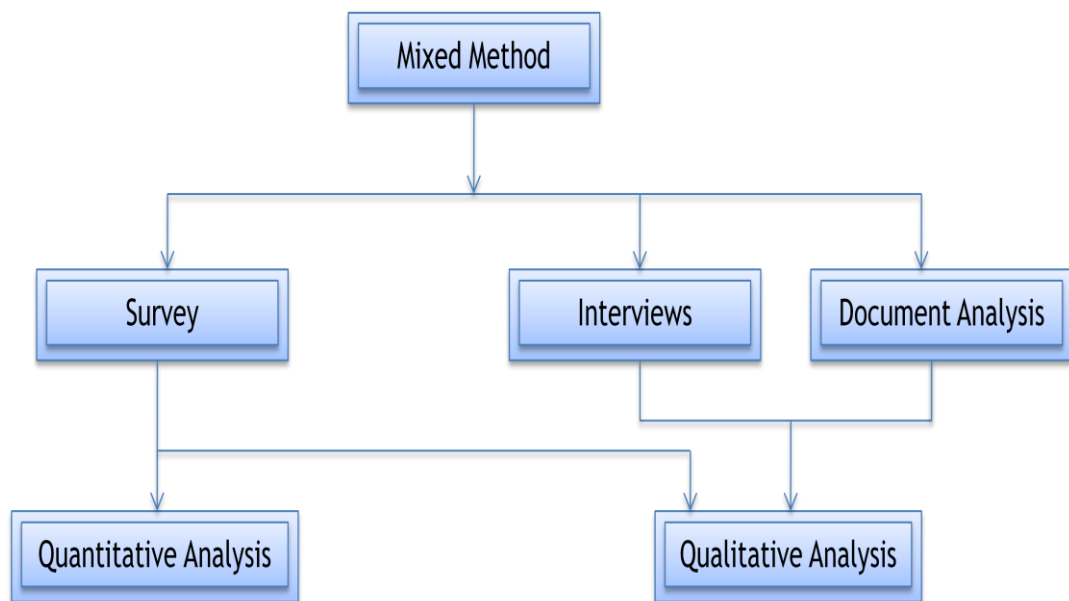


Figure 8: Research Methodology Design (Adapted from Zina O' Lary, 2004)

As shown in Figure 8, the study followed Mixed methods design which evolved from the notion of 'Triangulating' the information from different data sources, a technique that emerged first from psychology (Campbell & Fiske, 1959) and sociology (Denzin, 1978) but that reached its fullest application in applied research areas such as evaluation (Patton, 1990). Survey, interviews and document analysis were triangulate to investigate current software market situation, user satisfaction, problems, improvements, new needs and demands of software. The

data collected were qualitative and quantitative by nature therefore both the majors of analysis were used during analysing the data as shown in Figure 8.

The subject of the research is purely innovative and related to the use of products. Therefore quantitative and qualitative approaches of data analysis were used. A Survey questionnaire was an essential tool for the data collection during this research to assess and investigate current software market situation, user satisfaction from the product used along with frequently used modules. According to Altinay & Paraskevas (2008) questionnaire is effective in systematic collection of information from a large number of respondents, at low cost, to produce summaries and quantitative descriptions. Quantitative data is measurable, the measurement has magnitude usually expressed in numbers, providing easy to apply mathematical procedures to analyse the data (Walliman, 2004). Most of the respondents of the survey were the employees of hotel chain in managerial positions having long experience of work therefore it assumed that the number of respondent was not vital for this study but the representation of three chains of hotel was mandatory. Since business chains are based on same principals and operate with similar structure the number of respondents did not have a negative impact on the result of the study. Therefore, focal data and issues for research had similar validity as it goes with larger volume of respondents. The survey was used to get a generalized picture of software participation and its implication within the service phenomenon in three hotel chains in Finland.

According to Floyd J. Flower, Jr. (2001) a smaller sample of personal interviews can produce a more useful data set than a larger sample collected through other modes of data collection methods. Floyd refers to the importance of qualitative data collected in the form of interview which can interprets ideas, and possesses description about phenomenon around and within the subject related to human activities, perception, belief and attributes (Walliman, 2004). Study needed further information to analyse the problems faced in using software, improvements required and needs of new modules of software. Therefore, an in depth study was conducted in the form of a smaller sample of personal interviews with managers of three hotel chains in Helsinki. The interview was focused on collection of data related to aim and purpose of the study. Document analysis was used as a tool for gathering and comparing information related to study, therefore, a triangulating data analysis can be made among data collected using three different methods, providing a reflection of the theories within the research area.

5.3 Data Collection

Internalisation towards importance and necessity of the research problem guided the study for developing three main data collection methods viz. survey questionnaire, interview and document analysis for empirical data collection so as to provide triangulating analysis on the

research problem. Study was carried to formulate generalised illustration of ICTs and role of software as a major component of ICTs in hotels in Finland.

With regards of study theme the survey questionnaire was prepared focusing some of the major aim of the research since other aims could not be assessed by the questionnaire. The questionnaire consisted of close ended, open ended, scale and multiple choice questions. The questionnaire prepared was presented to the CEO of Vetokosultit Oy in order to get a pilot review. Some suggestions regarding module evaluation were received with some correction. Assimilating the suggestion questionnaires were reformatted and sent for pre-testing in one of the international hotel in Helsinki with the aim to reduce survey development time, improve quality of data collected and minimise non sampling errors (Sharma, 2005)

The survey process was initiated by sending a request email to the 20 respondents regarding permission for survey conduction within the organisation (hotel chains) in Helsinki metropolitan area. A couple of replies were received from the respondents sent back with permission querying about the date and time of conducting survey. The number of responses from industry was not enough for the research therefore; authors visited non responding hotels without prior information. Authors introduced the purpose of arrival and motive of research to respondents at reception along with the 'To Whom it May Concern' letter given by thesis coordinator of Laurea UAS, Kerava. The letter clearly stated motive of the study requesting for assistance to the students for interviews. The respondents were assisted by the authors wherever required during sample collection procedure. The sample was collected from 10 hotels out of three major hotel chains of Finland in Greater Helsinki region. All in all 23 samples were collected, out of which 2 questionnaires were invalid due to multiple answer selection for some scale questions. The feedback sessions were conducted after survey among the surveyed employees of the hotels in order to collect additional information about the choice of the answers.

During sampling process of questionnaire, three hotel managers working at different departments of the hotels representing three hotel chains were further interviewed with the aim to collect qualitative data for reasoning the impact and need of ICTs with software as a major component. It was one of the vital fragments of the research process.

Document analysis was based on prior research made on international level in the form of research paper available in 'Information and Communication Technology 2010' and other relevant literature as mention in the upper mentioned section of the thesis. The prior research made by one of the author during his internship was another basis of this analysis.

5.4 Data Analysis

After having done the survey, a crystal clear picture was developed regarding research problems and the result of investigation which showed a surprising phenomenon related to soft-

ware market situation in hotels in Finland. The user perception through scaling questions provided the basis to interpret about user satisfaction from system, friendliness of system and prior knowledge about operating the system but it provided a generalised information and common perception of the users.

Authors used SPSS software to analyse the survey questionnaire. Coding of the questionnaire was done for every question so as to define variables to allocate data for analysis and processing with software. Frequency tables and bar charts were developed using SPSS for associating the data collected therefore, illustration of data and correlation of them can be visualise in the form of a figure.

The interviews were analysed in order to explain some of the elements of the research which were not observed and explored by survey clearly. The analyses of interview are explained in association with analysis of survey since the interview and survey were interrelated and create a close connection with the research problem.

6 Empirical Findings

The aim of the study was to explore the answers of question, ‘Which are the new emerging niches in hotel industry to develop new software?’ Result of survey, interviews and document analysis were the foundation for findings of the research. This section deals with findings straight and is structured to explain the outcome of the research delivered by different methods used. The results of the research are analysed using quantitative and qualitative patterns of analysis focusing the major phenomenon noticed during research.

6.1 Current software market situation of PMS

The survey conducted in three major hotel chains to analyse the market situation of Property Management System used in Finland. The distribution of survey is detailed in Table 9. There were 9 respondents from Restel Group, 7 From SOKOS and 5 from Scandic hotel chains.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Restel Group	9	42,9	42,9	42,9
	Sokos	7	33,3	33,3	76,2
	Scandic	5	23,8	23,8	100,0
	Total	21	100,0	100,0	

Table 1: Total number of hotels and respondents participating in survey

Figure 9 further explains the percentage of participation of hotel chains in the survey. Restel Group was the highly surveyed chain more than 42.9% of participation. “Restel Group operates 47 hotels in Finland. The group consists of domestic hotel chains Cumulus and Rantasipi as well as hotels from international chains Holiday Inns, Crown Plaza and Ramada. There are

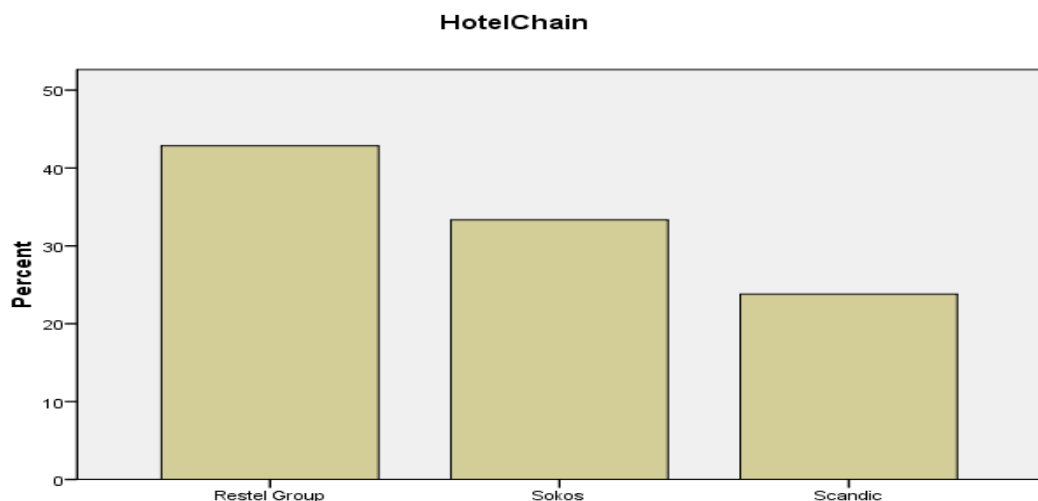


Figure 9: Representation of hotel chains

26 Cumulus, 11 Rantasipi, 7 Holiday Inns, 1 Crowne Plaza, 1 SeuravaHuone, and 1 Ikaalisten Kylpyla. The only one Ramada operating at Helsinki-Vantaa Airport is no more in function” [R1]. Realising the fact about domestic and international chains run by Restel the surveys were conducted in international and domestic chains in order to get views and variation of operation in two different kinds of hotels therefore the participation of Restel Group was larger in research.

SOKOS is expanding domestic chain of hotels in Finland which has expanded hotels internationally in Estonia and Russia. “There are 38 hotels of SOKOS chain in Finland operating with same name and operational structure.”[R2] Taking consideration the nature and functional style of chain, 7 samples of research data were collected from the chain representing all 38 hotels of the chain.

Originating from Sweden Scandic hotels are expanded in Nordic countries along with other European countries. According to [R3] the chain is owned by EQT partners and operating 22 Scandic hotels in Finland with the aim to expand in smaller cities of Finland too. Scandic hotels are running on same principles with similar operation styles therefore; we collected 5 samples for research from two Scandic hotels in Helsinki metropolitan area. The sample represents all the 22 hotels of the chain in Finland.

All the three hotel chains surveyed are using PMS developed by Micros/Fidelio for hotels’ day to day operation. Figure 10 shows the percentage of use of PMS in three hotel chains and table 2 describes it numerically.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hotellinx	1	4,8	4,8	4,8
	Amadeus	3	14,3	14,3	19,0
	Opera	11	52,4	52,4	71,4
	Others	1	4,8	4,8	76,2
	Fidelio	5	23,8	23,8	100,0
	Total	21	100,0	100,0	

Table 2: Illustration of PMS used in three major hotel chains in Finland

In Case of Restel Group, all the continental hotels of the chain along with Crown Plaza are using Opera PMS but all the other local hotel chains such as Cumulus, Rantasipi etc are using Amadeus. One of the respondents from hotel Cumulus mentioned during interview

“Cumulus is using Amadeus largely and Hotellinx partially; I mean that around 7 to 8 Cumulus hotels are using Hotellinx”. [R1]

Scandic hotels are using Fidelio developed by Micros/Fidelio. It is former version of Opera PMS developed for command mode. The manager interviewed mentioned

“We are in the process to switch the software from Fidelio to Opera. How long will it take cannot be made sure but it will be changed.” [R3]

This information clearly states that Opera is the largely used PMS in three hotel chains. Amadeus and Hotellinx are popular among local chains of Finland according to the result obtained during surveys and interviews. All the internationally growing hotels of Finland are using Opera because of its brand name and longer experience of Micros in providing ICT solution for hospitality industry.

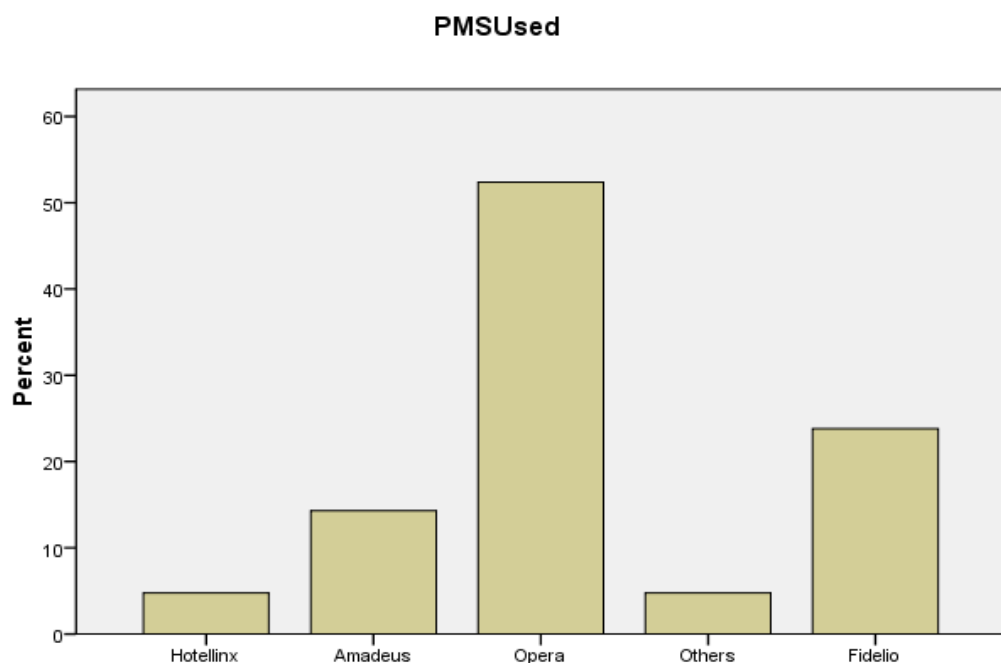


Figure 10: Illustration of PMS used in three major hotel chains in Finland

6.2 Customer satisfaction from PMS

The survey was conducted among employees with different positions at different department of the hotel chains. The number of respondents and their position are explained with the help of Figure 11 and table 3.

		Current Position			Cumulative Percent
		Frequency	Percent	Valid Percent	
Valid	Service Manager	2	9,5	9,5	9,5
	General Manager	1	4,8	4,8	14,3
	Duty Manager	2	9,5	9,5	23,8
	House Keeping Manager	2	9,5	9,5	33,3
	Restaurant Manager	1	4,8	4,8	38,1
	Receptionist	9	42,9	42,9	81,0
	Front Office Manager	1	4,8	4,8	85,7
	Hotel Manager	1	4,8	4,8	90,5
	Sales Executive	1	4,8	4,8	95,2
	Waiter	1	4,8	4,8	100,0
	Total	21	100,0	100,0	

Table 3: Number of respondents with Position in hotels

As illustrated in Figure 11, the survey was conducted among managers, waiters, executive and receptionists. The sample was collected from 10 managers working in the different departments of hotel chain, 1 sales executive, 1 waiter and 9 receptionists. The concept behind this set of respondents was to get different views and perspectives about PMS and its operation from the point of view of management and frontline employees. Research tried to explore the possibilities to develop augmented software for the contemporary PMS therefore the need of augmentation is analysed at two different levels of hierarchy.

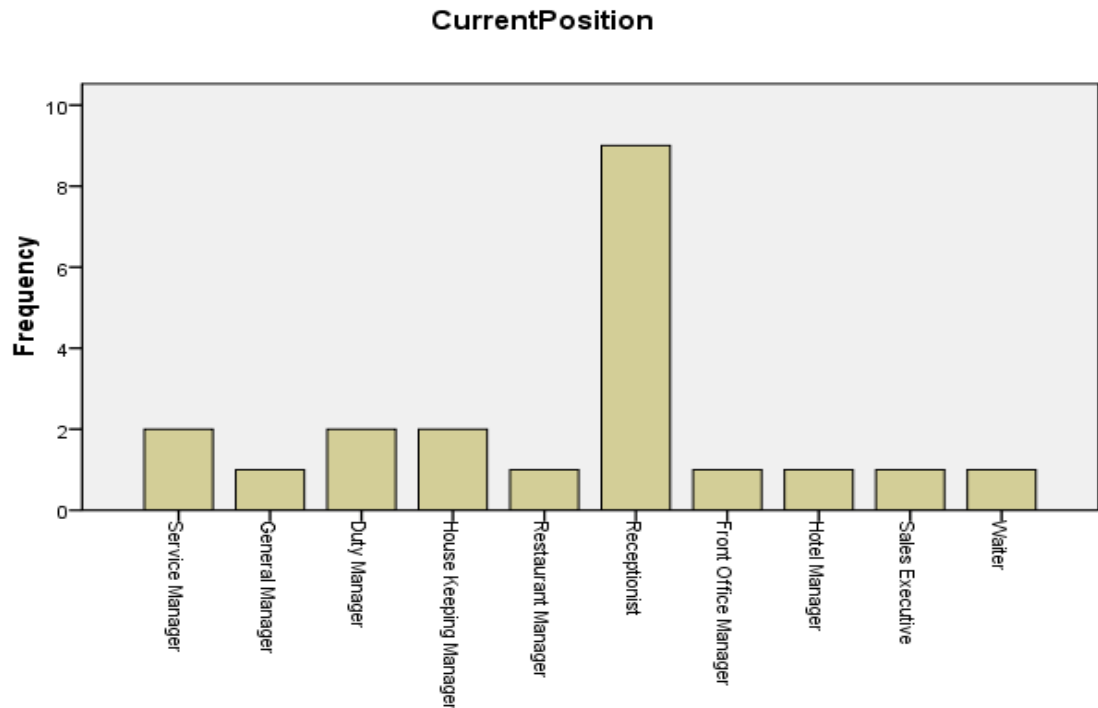


Figure 11: Representation of respondents on the basis of position

The highest percentage of respondents was 42.9 representing receptionists in three hotel chains. Second highest percentage of respondents was 28.5, carried out by service managers, housekeeping managers, and duty managers respectively. Rest of all the other respondents represented 28.6 percentage of total sampling. The survey further explores about the satisfaction of user on the use of contemporary PMS. User satisfaction was analysed using a scale question representing the agreement and disagreement on satisfaction from the product used for operational purpose in hotel chains. Since every chain was found using same property management system except domestic hotels chains of Restel Group (Amadeus and Hotellinx), the distinction among the data collected is not separated and was analysed in totality.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	5	23,8	23,8	23,8
	Agree	7	33,3	33,3	57,1
	Neither Agree nor Disagree	2	9,5	9,5	66,7
	Disagree	6	28,6	28,6	95,2
	Strongly Disagree	1	4,8	4,8	100,0
	Total	21	100,0	100,0	

Table 4: Level of satisfaction of user using PMS

Table 4 and Figure 12 is the illustration of user satisfaction level from users' perspective for PMS used. Out of 21 respondents 12 stated that they are satisfied from the operational performance of the software in most of the module they have used whereas 7 respondents forwarded the disagreement of satisfaction using the software. During interview with manager of the hotel having dissatisfied users, it was disclosed that the users were not trained well and

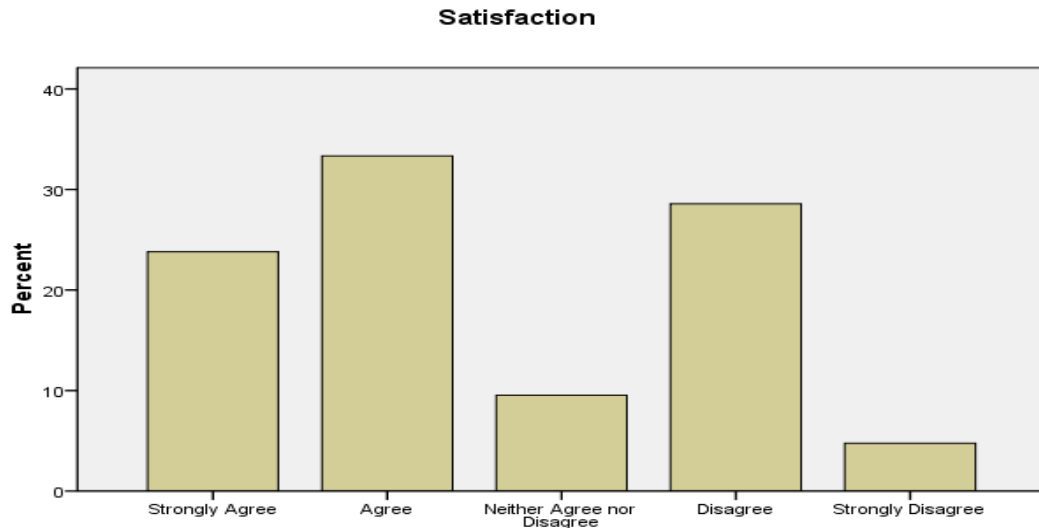


Figure 12: Representation of satisfaction of users using PMS

there was a frequent interruption in network connection. Dissatisfied users mentioned similar issues as the answer of the open ended questions regarding problem faced using PMS. Some of the users mentioned language barrier as one of the reason of dissatisfaction since Micros PMS were only available in English language interface for them. As shown in Figure 12 the majority of agreement was 57.1 percent and disagreement was 33.4 percent whereas 9.5 percent respondents were seen neutral. This survey shows that there is a possibility for improvement of the software used. The users using Amadeus in Cumulus hotel chain were quite happy and mentioned that the software is available in Finnish language. Users of Amadeus PMS were not able to check the availability of rooms in other hotels of their chain. It was a major drawback of the software. They needed to contact service centre of the chain for the information of availability in other hotels whenever required by customers.

6.3 Problems in Using PMS

The open ended question regarding the problem faced using PMS was answered by those users who felt operational and other external problems related to functionality of PMS. The types of problems faced are illustrated and analysed with the help of table 5 and Figure 13. There were only 12 responses for this question from the respondents. One respondent mentioned that the system shows error messages time to time during processing. The system was not able to close interfaces to multiple rooms at the same time was another problem faced by

one of the respondents while using PMS. The response regarding hang over of the system was reported by 3 of the respondents. One of the respondents pointed out the problem of simplicity indicating too many buttons in software interface.

By indicating buttons, respondent discloses that the software has several functions and for each function the use of different button is required. User was willing to work with software which can provide different function in one window have few buttons to operate the function. One of the respondent mentioned the language barrier with software since it was available in English. The intention of the user was to get software with multilingual interface in order to operate it in other languages especially Finnish. This response shows the importance of multilingual software and the reason of their success.

A respondent mention the limitation of software since it could not accept all bank cards. While querying about the acceptance of bank card from the service manager of the hotel it was realised that hotels have problem in accepting royalty cards also. Since hotels cannot use the same card reader for bank and royalty acceptance purposes. The service manager further mentioned that the hotels used different card reader to read royalty cards.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Error message	1	4,8	8,3	8,3
Not complete transaction	1	4,8	8,3	16,7
Closing interfaces to multiple room at same time	1	4,8	8,3	25,0
Sometimes software not working totally	3	14,3	25,0	50,0
Several buttons should be customised to less for simplicity	1	4,8	8,3	58,3
Software needs to be in Finnish	1	4,8	8,3	66,7
Do not approve all bank cards	1	4,8	8,3	75,0
Outdated	3	14,3	25,0	100,0
Total	12	57,1	100,0	
Missing System	9	42,9		
Total	21	100,0		

Table 5: Representation of satisfaction of users using PMS

The users of one of the hotel chains mentioned that the software they use is command based. 'In the era of GUI (Graphics User Interface) based software the command based software is outdated. It is not appropriate to use it for customer service purposes' [R3] during survey the respondents mentioned that they cannot use mouse with the software and keyboard is tool to provide input to the system. Meanwhile same respondents mentioned that the chain has planned to switch the software from command based into GUI and the new software is in processing phase installed in the hotel system. The hotel chain bought GUI Based software from the same software house which provided command based software for the chain earlier.

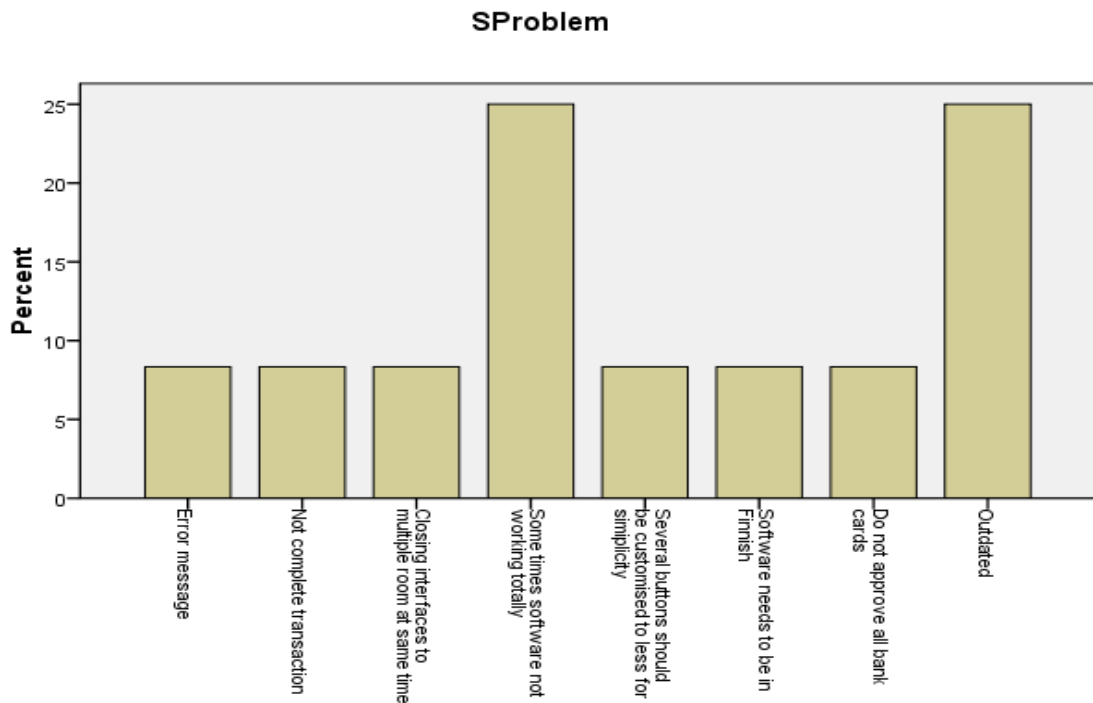


Figure 13: Representation of users' satisfaction from Property Management System

Figure 13 is the bar chart of the open ended question asked regarding problem faced using PMS to respondents. 57.1 percent of the respondents answered the questions and 42.9 percent were seen passive in regard with this question.

6.4 Improvements required

Table 6 and Figure 14 are the illustration of the responses given by the respondents for an open ended question querying about the additional functions and improvements need in the PMS used. The question received different functions to be added with only on improvements to be made. The major concerned was paid for the slowness of the system. Additional functions required in PMS can open a new module for PMS to be developed as an augmented service within the system.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Reservation Check In-Out	1	4,8	12,5	12,5
	Central Reservation System	1	4,8	12,5	25,0
	Slow operation	5	23,8	62,5	87,5
	Handling of customer benefit cards	1	4,8	12,5	100,0
	Total	8	38,1	100,0	
Missing	System	13	61,9		
Total		21	100,0		

Table 6: Illustration of Improvements required in PMS

Table 6 represents open ended question regarding additional function needed for PMS. There were total 8 responses out of 21 respondents. 13 respondents did not reply to the question. The function required to be added and improvements needed were group check in check out function in PMS, direct connection to central reservation system, functions to handle customer benefit cards and other royalty cards. One of the respondent mentioned that the software does not facilitate group check in and checkout facility. It showed that the software was just able to make individual check in and check out for the customers. Direct connection to CRS is essential in order to get immediate information regarding price and room availability offer of other hotels of same chain at the front desk. This facility provides front desk officer a tool to provide options for the customer during rush if the room is not available in the hotel at the moment when customer walked in. Handling of customer benefit cards was another feature demanded for improvement. Most of the software is not able to provide facilities of handling of customer card from the same card reader which is used for cash card. It is an issue of further discussion and development in hospitality industry since the system of cash card and customer benefit cards are still separate and there is no virtual and organisational connection between services.

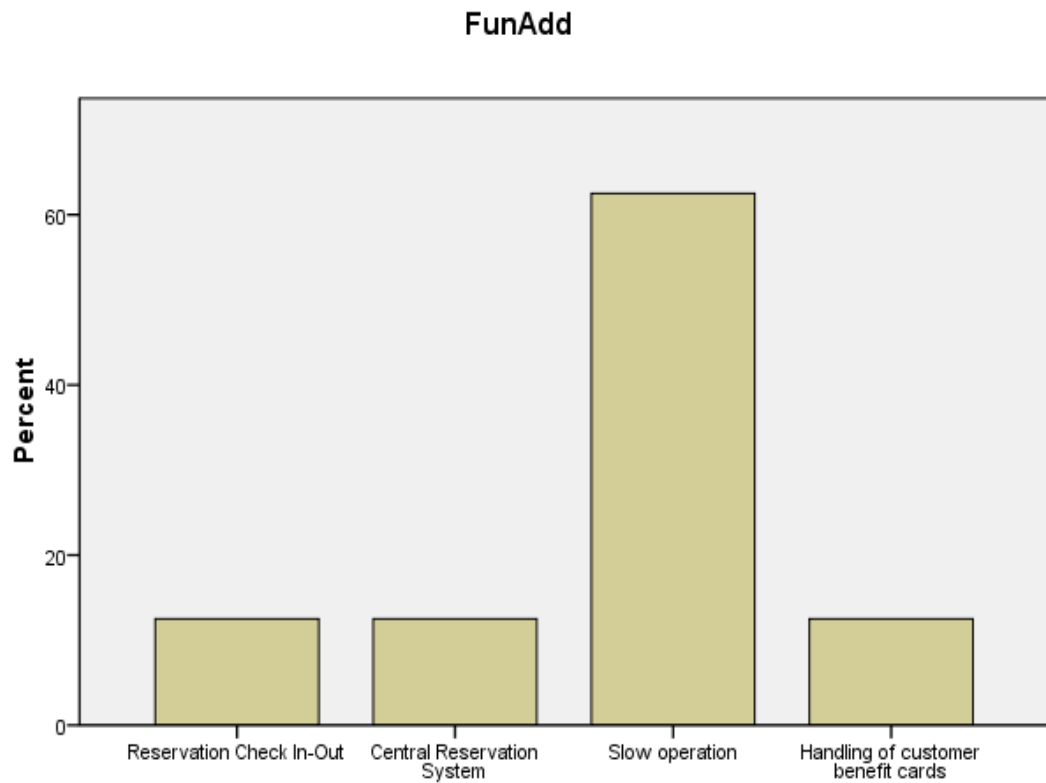


Figure 14: Illustration of improvements required in PMS

5 respondents mentioned that system is slower and during rush hour they usually have long queue of customers waiting for check in and check-out purposes. The system was considered slow because of slow processor, other hardware configuration along with interruption in network connection and need of operating multiple functions at a time.

6.5 Future needs and demands

Among three open ended questions of the survey questionnaire, the last question was dedicated for specifications related to future need of new module of software and the demand of new request and ideas to be appended to the PMS. Table 7 and Figure 14 present the responses for this open ended question. There were few responses to the question since it was a question related to innovation in technology. 6 responses were received out of 21 surveyed done in different hotel chains. There were 4 responses which provided an emphasis on the development of smart phone software. According to the description given the respondents were willing for a software which can be operated in smart phones for reservation making purposes, confirmation of reservation was expected to send through smart phones in order to provide an ease for reservation to the customers. Some respondents mentioned that though they have a facility to

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Smart phone software	4	19,0	66,7	66,7
	SMS facility for quick information	1	4,8	16,7	83,3
	Complicated to use	1	4,8	16,7	100,0
	Total	6	28,6	100,0	
Missing	System	15	71,4		
Total		21	100,0		

Table 7: Representation of Future needs and demands of software module in PMS

send a confirmation through email but it is done only if the reservation is made from hotel's website. The respondents suggested that if PMS can be given a new feature to send SMS to the mobile of the customer soon after receiving a reservation either from hotels sites or the

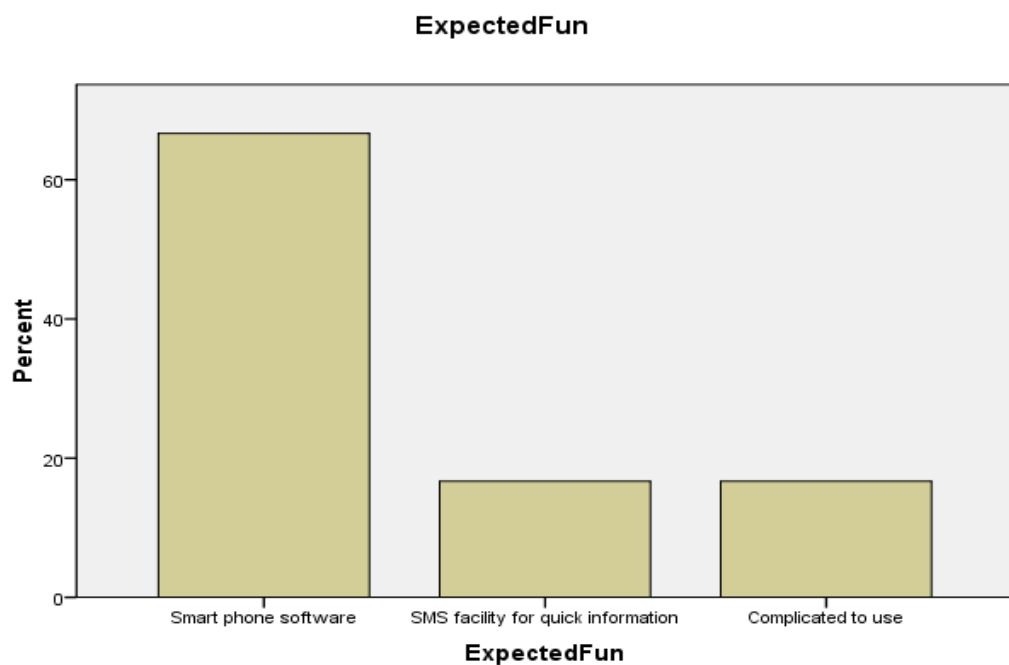


Figure 15: Representation of Future needs and demands of software module in PMS

site of other intermediaries, will help the process to be faster and easier for customer and the hotel. One of the housekeeping managers suggested that if rely of information could be done through PMS in the form of SMS, emergency housekeeping services can be carried out for any room at any floor of the hotels by employees. Currently, they are depending on mobile calls in order to inform the changes or emergencies to the employees which is time consuming. At the same time calling different employees for more than one emergency is not possible therefore; SMS system through PMS seems to be an effective idea to deliver different information at the same time to different employees.

One respondent mentioned that the system seem to be complicated since it is based on command mode and one needs to learn a lot of codes for operating different functions in PMS. This idea suggest for the development of Graphical User Interfaced PMS with simplicity so as to make employee function faster with less efforts.

Figure 15 is the graphical representation of future needs and demands of software module in PMS. The chart clearly shows that 13.8 percent respondents have emphasised the development of smart phone software for hotel operation including SMS facility for quick information. It is one of the major demands today since none can bypass the importance of smart phone in day to day life. Development of such module will enrich the capacity and functionality of the contemporary PMS.

6.6 Summary on Empirical Findings

As a student of tourism, the researchers get acquainted with ICTs and its role in the expansion of tourism. The significant of technology and its impact on business management was realised. Researchers got enlightenment of the knowledge through theoretical concepts of ITCs and the role of software in customer service process within hotel industry.

How hotels are using software to manage properties and service environment was clearly understood from the study of software in three hotels chain. The study found that Opera PMS is the widely used PMS in three chains. SOKO and Scandic hotel chains are using software from Micros/Fidelio. In domestic hotels of Restel the variation was found in terms of using PMS since they were using Amadeus and Hotellinx PMS whereas Opera PMS was being used in international hotel chains of Restel.

Opera PMS was seen leading brand of PMS among the international chains of hotels in Finland. User of Opera was satisfied by the software and its performance but still they need some more facilities and modules as analysis found. There were some problems indicated by the users during survey and interviews in regard with PMS used. Few problems were arisen during the study related to PMS. The major demand of the user was simplified software with real time training.

The major focus of user was given in smart phone technology and software related to smart phones. The hotel chains have not developed mobile web pages for reservation and information purposes. The need of such developments was felt by the users. The users of the software disclosed that it would be better if software can provide facilities to send SMS to employee group concerning emergencies and immediate action for providing easy to the customer especially in housekeeping section of the hotel.

Handling of customer benefit card was another problem identified by the respondents. They need a module of software which can handle customer benefit card and maintain customer account accordingly using the same card reader machine. Therefore, time and energy can be saved to provider faster and efficient customer services.

Language interface was one of the issues arisen during the study. The software was demanded in multilingual interfaces and major focus was given to Finnish language. This feature in software can increase the level of friendliness of the software according to the respondents.

Ultimately, it can be said that there is a possibility to develop different module of software to be appended to the contemporary software in order to make increase the level of friendliness and efficiency of software. The possibility of developing new PMS with improved features is shown by the study since domestic hotel chains are independent to make decision for the selection of services for better service operation in collaboration with technological implications.

7 Validity and Reliability

Validity and reliability of this research is based on the answers given by respondents. Survey questionnaire and interviews were major sources of information, which have been explained, discussed and triangulated during research procedure and the development of empirical findings. The study was made rigorously; all the facts and Figures gathered during study are related to research questions and directly put forwarded in the form of findings as they were received. Findings of the study are generalised on the basis of the interviews which were conducted at management level to validate the issues raised during survey. Feedback sessions after survey were conducted to confirm the validity and reliability of the responses from respondents.

“Quantitative analysis allows representing the opinions, attitudes and behaviours of people or organisations in quantitative terms and drawing interferences from numerical analysis for a study.” (Altinay & Paraskevas, 2008, p.220)

The information obtained from the respondents is fed as they were given and processed with the help of SPSS in case of survey. In order to get the ideas of output of the survey precisely the researchers conducted interviews with managers of hotels and collected further information on research problem.

The process and analysis were based on theoretical frame work of ICTs and data collected with mixed methods. The data collected for research was representing the software used in three chains of hotels in Finland. The analysis is based on this representation; this research is an initiation in the field of tourism and may provide opportunity for future research.

8 Discussion

Being the student of tourism during this research we got to realise the importance of ICTs and its implication in tourism industry. The global expansion of tourism has changed the way of customer services from suppliers' side and the utilization of sophisticated technology has changed the demand and need of the customers in contemporary society. The level of understanding at level of hierarchy within organisation was another part of the learning. Survey and interviews were fascinating experiences which directed us to know how and why information has to be taken from different level in order to assess a picture of service process and weakness of the product along with attributes it possesses.

The software market situation of PMS in Finland was surprising since major hotel chains were seen using the similar system to operate their customer service points. The reason behind using single system leaded us to understand the reliability, popularity, expertise and reputation of the system. The concept of branding and brand bonding was very clear in front of us. The requirement of training and updating information on the system used was seen essential during study. Study found that some of the untrained employees were not well efficient to carry out proper use of the systems installed in the properties. Therefore, the organisation may suffer from malfunction during services procedure which may bring lack of authentication and validation in transactions made between organisation and customer.

Only efficient systems and environment are not enough to develop efficient service until employees are not provided with efficient and reliable orientation and documentation regarding the environment and the system they exit and use. The use of technology has to be implemented on employee centric basis. Scandic hotel chain has set up an example of this process. During research interview a respondent mentioned "We have both the older and newer PMS of Micros/Fidelio and we are providing access for both the systems to our employees because of the mastery on the older system some employees are still using it for service generation but the change will be made, it is obvious and we are preparing employees for it." [R3].

Changing technology brings new opportunity, trends and business with it. An organisation required to be ready to utilize the opportunity created by technology was a lesson we learnt during the study. Domestic hotel chains of Restel group are changing from older software to newer in order to gain opportunity created by technology. As mentioned by one respondent of the Restel group (Culmulus hotel chain) "We were using some other systems and we switched it with Amadeus and now some of us are changing to Hotellinx. This shows that how independent we are while deciding for technology and its use". All the information gathered were equally important for the study of the problem from the point of view of technology and tourism.

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10 Appendices 1-5

Appendix 1: Lists of Figures and Tables

Figures:

Figure 1: Research Outline of the thesis	9
Figure 2: Flow of information in tourism industry (Sheldon, 1997)	11
Figure 3: Information sharing using software	12
Figure 4: Characteristics of Tourism Services (Concept from Philip Kotler, et.al., 2003, Sheldon, 1997)	13
Figure 5: Illustration of Online Software used for eTourism	15
Figure 6: Property Management System Interfaces (Concept from Sheldon, 1997)	17
Figure 7: PMS Interfaces at Sheraton Hotel (Sheldon, 1997)	18
Figure 8: Research Methodology Design (Adapted from Zina O' Lary, 2004)	23
Figure 9: Representation of hotel chains	27
Figure 10: Illustration of PMS used in three major hotel chains in Finland	29
Figure 11: Representation of respondents on the basis of position	31
Figure 12: Representation of satisfaction of users using PMS	32
Figure 13: Representation of satisfaction of users using PMS	34
Figure 14: Illustration of improvements required in PMS	36
Figure 15: Representation of Future needs and demands of software module in PMS	37

Tables:

Table 1: Total number of hotels surveyed	27
Table 2: Illustration of PMS used in three major hotel chains in Finland	28
Table 3: Number of respondents with Position in hotels	30
Table 4 Level of satisfaction of user using PMS	31
Table 5: Representation of satisfaction of users using PMS	33
Table 6: Illustration of Improvements required in PMS	35
Table 7: Representation of Future needs and demands of software module in PMS	37

Appendix 2: Respondents' Code for interview

Code [R]	Respondents Domain	Brief Description
R1	Hotel	Duty Manager of the hotel
R2	Hotel	Service Manager of the hotel
R3	Hotel	Reception Manager of the hotel
[R]=Respondent		

Appendix 3: Survey Questionnaire

Part 1

Your current position: _____

Number of years in this position: ____

If you are a manager of people, how many people are in your group: ____

Part 2

1. Please mark the Property Management Software you use.

- a. Hotelinux
- b. Amadeus
- c. Opera
- d. Others_____

2. What functions of the software you use? Please mark the function that you often use in the software.

Functions	Mark
Reservation	
Front Desk	
Accounting	
Yield Management	
Housekeeping	
Restaurant Management	
Customer Profile Management	
Rate Management	
Back Office Management	
Cashiering	
Point of Sales	
Commission Management	
Report Management	
Room Management	
Property Management	

Please mark one of the following options for each statement on the basis of your perception.

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
3. I feel easy to use this software.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. The software is user-friendly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I feel easy to use this software.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I have been given training to use this software.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I do not notice any inconsistencies as I use it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I quickly became skilful using this software.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I am satisfied with it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. What functions do you want to be added to the software in order to make is more efficient?

11. What are the problems that you face while working with the software?

12. Have you felt some new requests or problems or idea that you think should be appended to the software? Please mention

Appendix 4: Interview Questions

Name of hotel_____

Position of Employee_____

1. How the decision for buying software is made in hotel chain?
2. What problems do you face using property management software in your hotel?
3. What modules would you like to add to the software being used?
4. Does chain use same software in all the hotels in Finland? If not what are the other software used and why?

Index 5: The press release

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**PRESS RELEASE****OPERA (MICROS/FIDELIO) IS POPULAR IN THE HOTELS OF FINLAND!**

The head line is one of the findings of the thesis study titled Software in Tourism Industry-A Study on Emerging New Niches to Develop Software in the Hotel Industry conducted by Tourism Degree Students, Krishna Kumar Regmi and Bikesh Thapa from Laurea, Kerava Unit in December, 2010. The study deals with software market analysis of accommodation service sector in three major hotel chains of Finland (Restel Group, SOKOS and Scandic). The focus of the study was to find emerging new niches of software by assessing employees' satisfaction level in using PMS (Property Management System), problems occurred during system handling, new ideas and needs. The thesis is an example of innovative and research oriented approach to studies in Laurea's Tourism Degree Program that proves diversification in moulding students' knowledge with the use of Laurea's pedagogical innovation, 'Learning by Development' method.

The study addressed role of ICTs (Information and Communication Technologies) in Tourism industry focusing accommodation service sector in Finland. Emphasis was given in analysing drawbacks of the contemporary software and budding new niches for the development of new software modules. The study contributed to the importance of software as major components in ICTs and came up with recommendation for emerging niches of software within the industry.

The results showed that Micros/Fidelio is the leader in providing PMS to the hotels. Domestic hotel chains of Restel were using Amadeus and Hotellinx PMS whereas international chains were operating services in support with Opera PMS (Micros/Fidelio). Language interface was one of the issues arisen during the study. Study states the demand of multilingual user interface where Finnish language has to be prioritised.

According to the study, there are possibilities to develop different software modules to be appended to the contemporary system in order to make an increment in the level of friendliness and efficiency of software. The possibility for developing new PMS with improved features is shown since domestic hotel chains are independent to make decision for the service selections in order to receive better service operation. The industry is ready for technological enhancement supporting the innovative and productive implementations in Finland.

The authors hope that this study will provide a new insight for further research and development in the field of travel and tourism operative systems being considered by software houses, accommodation service sector and Laurea in Finland. This study signifies the role of ICTs studies within the curriculum of different program in educational institutions so as to develop tech savvy manpower for future. The thesis opens path for new researches providing a number of opportunities for new theses to be developed concentrating on the importance and implementation of ICTs for competitive and strategic development of services in Travel and Tourism industry.

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